

**STS-114/BI125
FLIGHT READINESS REVIEW
PROGRAM**

June 29, 2005

Solid Rocket Booster

AGENDA

Presenter:
Michael Wyckoff

Organization/Date:
USA-SRB/6-29-05

- Certification Status
 - Status reported as of 6-28-05
- Special Topics
 - SRB Design Changes and Major Concerns Resolved
 - SRB Recovery Vessel Upgrades and Postflight Enhancements
 - SRB Accepted Risk Causes and Controls
 - STS-300 Launch on Need (LON) Readiness
- Readiness Assessment

CERTIFICATION STATUS COFR EXCEPTIONS

Presenter:
Michael Wyckoff

Organization/Date:
USA-SRB/6-29-05

Category	Remarks	Constraint
Failure Modes and Effects Analysis/ Critical Items List (FMEA/CIL)	3 open FMEA/CIL updates <ul style="list-style-type: none"> Pending PRCB (Outside of Board (OSB)) approval <ul style="list-style-type: none"> Approved by Level V, IV, and III and Marshall Safety Review Panel (MSERP) 	Prelaunch MMT
Hazard Reports (HR)	7 open HR updates <ul style="list-style-type: none"> Pending PRCB approval (6 OSB) <ul style="list-style-type: none"> Approved by Level V, IV, and III and MSERP 	Prelaunch MMT

CERTIFICATION STATUS COFR EXCEPTION

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Nonconformances	<ul style="list-style-type: none">• 4 open nonconformances• Suspect Confined Detonator Fuse Initiator (CDFI) mica disc/insulator debris concern<ul style="list-style-type: none">• Material Review Board (MRB) use as is• Pending released CR S062613A PRCB directive for approved expected debris table (PV4055756, PV4055777, PV4056642, and PV4056643)	Prelaunch MMT

SRB DCR EFFORTS

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SRB Global

Debris

- Transport
- Impact Tolerance *

TPS Issues

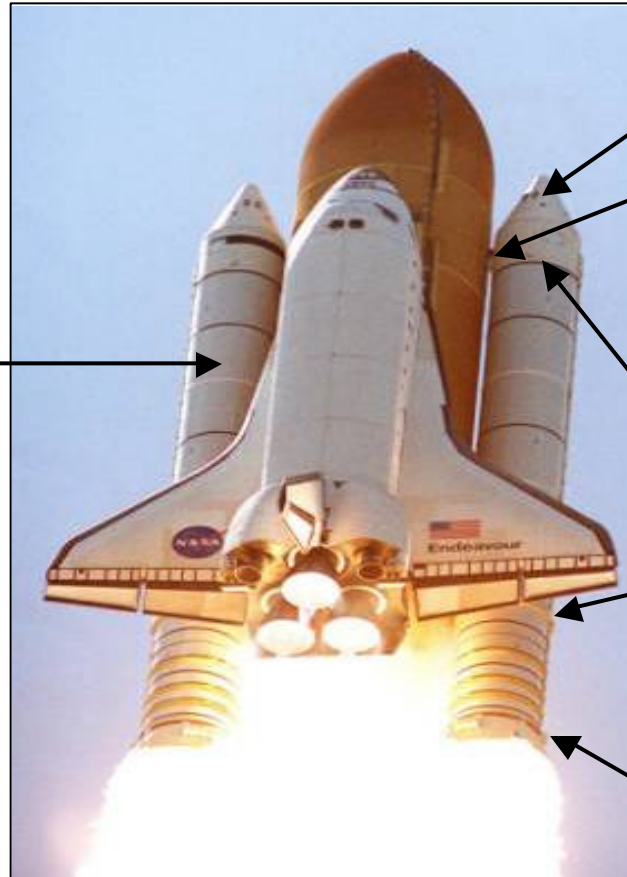
- Material Age Life
- TPS Recertification
- Extreme Wet and Cold

Loads and Environments

- Stud Hangup
- Rollout Fatigue
- Roll Maneuver
- Systems Tunnel
- STS-114 Flight Mission Specific

Pyro

- CDFI/CDFA
- NSI Pressure Cartridge



SRB Location Specific

Separation/Deceleration

- BSMS – Igniter, Aeroheat Shield, Plume, FOD, and Throat
- Bolt Catcher/NSI PC
- Forward/Aft Separation Bolts
- Thruster Pressure Cartridge
- Forward Skirt Aft Clevis Ring/Lower Bay

Imaging and Instrumentation

- ET Observation Camera
- ET RTF Instrumentation

ET/SRB Attach

- ET Attach Rings and Aft Struts
- Diagonal Strut Restraint Cable
- EPDM Covers

Aft Assembly

- FIV Connector and Backshell
- Aft Skirt GN₂ Purge (Prelaunch)
- Blast Container

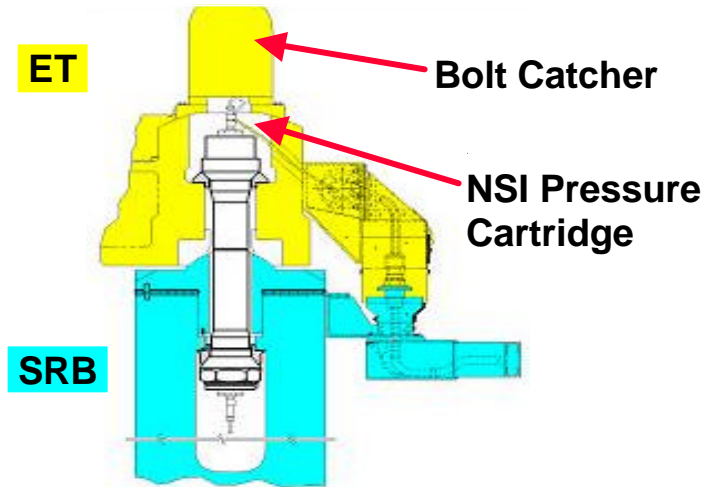
* Pending final SICB approval and release of exception to NSTS 07700, Volume X for violation of 1.4 strength factor of safety due to debris impacts

SRB DESIGN CHANGES AND MAJOR CONCERNS RESOLVED

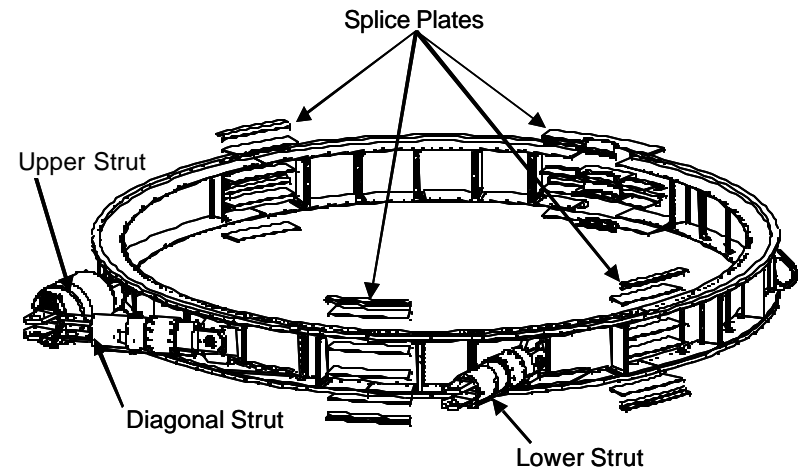
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Bolt Catcher Redesign and NSI Pressure Cartridge Retention Device



ET Attach Ring Strength and Safe Life Issues Resolved



BSM Erratic Pressure Eliminated and Throat Factor of Safety Proven



SRB Debris Identification and Impact Analysis



SRB RECOVERY VESSEL UPGRADES AND POSTFLIGHT ENHANCEMENTS

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**Updated and Improved Postflight
Assessment and Photograph
Requirements, Processes, and
Associated Documentation**

**Recovery Vessel Upgrades to Safety,
Communication and Weibel Radar
Debris Tracking**

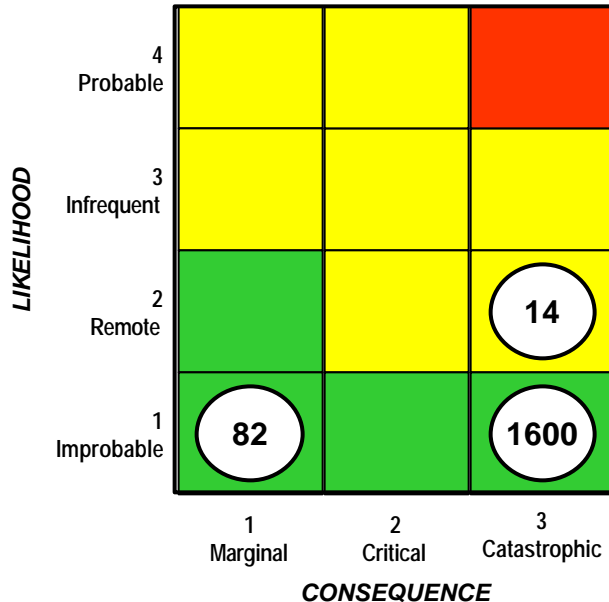


SRB-7

SRB ACCEPTED RISK CAUSES AND CONTROLS

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Classification

- Unacceptable Risk
- Accepted Risk
- Controlled Risk

Note: Proposed new hazard I-00-02, SRB Interface Debris Hazards is not shown (all proposed causes in report are Controlled Risk)

*Note: Hazard report has proposed changes for approval prior to RTF. (all proposed new causes are Controlled Risk)

**Note: Hazard report references external project hazard causes or causes in other SRB reports.

Hazard Reports		Remote	Infrequent	Probable	Catastrophic	Remote	Infrequent	Probable	Catastrophic	Remote	Infrequent	Probable	Catastrophic	Remote	Infrequent	Probable	Catastrophic
Accepted Risk Hazard Reports (6)																	
B-00-23	SRB SYSTEM FAILURES RESULTING FROM HIGH VOLTAGE SPIKES/TRANSIENTS AND DEBRIS IMPACT				2								1				
B-20-04/ A-20-24*	HYDRAZINE SOURCE IN THE PRESENCE OF AN IGNITION SOURCE				100								3				
B-20-08/ A-20-18	AUTOIGNITION OF HYDRAZINE WITHIN THE FUEL SYSTEM				17								3				
B-60-12*	DEBRIS IMPACTS ET OR ORBITER				123								6				
C-00-04*	DEBRIS IMPACTS ET OR ORBITER				20								1				
Controlled Hazard Reports (33)																	
A-20-06	PREMATURE START OF APU RELEASES HYDRAZINE OR HYDRAZINE BY PRODUCTS				4												
A-20-26	INTERNAL LEAKAGE OF HYDRAZINE INTO GAS GENERATOR BED				11												
A-30-07*	PREMATURE AFT BSM OPERATION				35												
A-30-08	FAILURE OF ANY AFT STRUT				24												
A-30-09*	DEBRIS FROM FORWARD BSM IGNITION AND AEROHEAT SHIELD FAILURE				43												
A-30-10	PREMATURE FORWARD SEPARATION BOLT OPERATION				21												
A-50-13	ERRONEOUS SRM IGNITION SIGNAL				5												
A-60-17	LOSS OF SRB HOLDDOWN				24												
A-60-20	FRANGIBLE NUT FRAGMENT				4												
A-70-15	SRB RSS DETONATION				4												
A-80-17	LOSS OF VEHICLE CONTROL				80												
B-00-28	ISRB FAILURE WARRANTING RSO'S DESTRUCT COMMAND	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
B-20-09/ A-20-04	HYDRAULIC FLUID SOURCE IN THE PRESENCE OF AN IGNITION SOURCE				261												
B-20-11/ A-20-23	HOT GAS IMPINGEMENT/EXHAUST DUCT ASSEMBLY LEAKAGE				35												
B-20-21	LOSS OF HYDRAULIC PRESSURE				89												
B-20-22/ A-20-16	APU TURBINE FRACTURE				33												
B-30-06	LOSS OF INTERELEMENTAL ATTACH MECHANISMS				49												
B-40-03/ A-40-11	PREMATURE OPERATION OF NOZZLE EXTENSION JETTISON (NEJ) PYROTECHNICS				11												
B-40-13/ A-40-22	NOSE CAP MALFUNCTION				22												
B-40-14/ A-40-12	PREMATURE OPERATION OF FRUSTUM LSC/FRUSTUM MALFUNCTION				23												
B-50-26	LOSS OF IEA POWER				37												
B-50-27	LOSS OF OR INTERRUPTED FIELD JOINT HEATER OR IGNITER HEATER FUNCTION				1												
B-60-05	THERMAL CURTAIN FAILURE				3												
B-60-24/ C-60-03*	AEROHEATING FROM LOSS OF TPS				8												
B-60-25	STRUCTURAL FAILURE OF SYSTEMS TUNNEL COVERS				5												
B-70-02	PREMATURE SRB RSS DETONATION				37												
B-70-16	LOSS OF DESTRUCT CAPABILITY				77												
B-95-02	EXTERNAL TANK TPS OBSERVATION CAMERA			56	116												
C-30-01*	INABILITY TO SUCCESSFULLY SEPARATE SRB'S FROM THE SPACE SHUTTLE VEHICLE (SSV) LEADS TO RECONTACT				134												
C-30-05*	SEPARATION SYSTEM FAILURE LEADS TO ET STRUCTURAL DAMAGE				3												
C-70-07	INADVERTENT SRB RSS DETONATION				37												
FSS-HAR-98-03	SRB CABLE ASSEMBLIES FOR ET ACCELEROMETER MEASUREMENTS AND SRB INSTALLATION			29	1												
X-00-19	LOSS OF LIFE, LOSS OF VEHICLE DUE TO SRB FAILURE LEADING TO FIRE AND EXPLOSION (RSL'S ABORT DECLARED)				37												

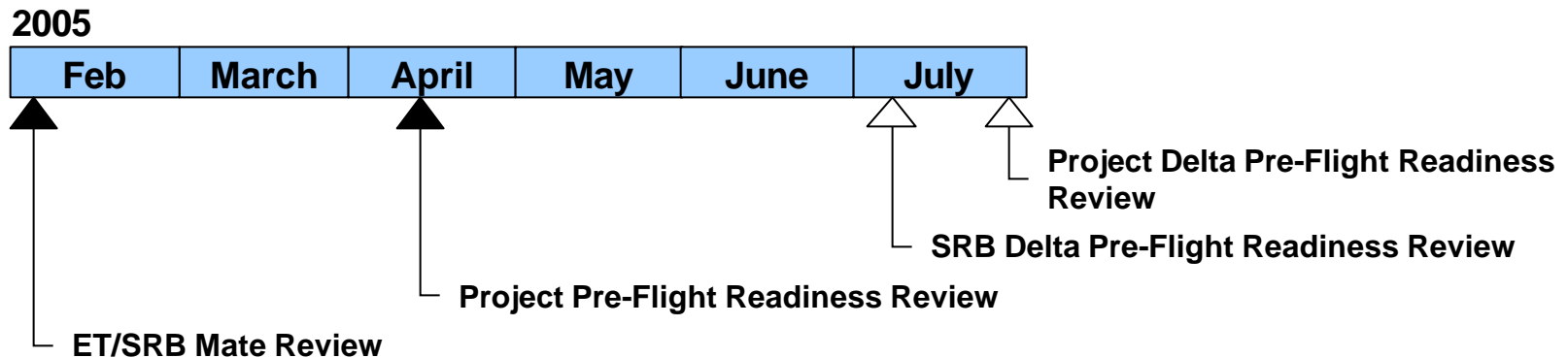
STS-300 LON READINESS

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STS-300 Launch on Need (LON) Readiness

STS-121/BI124 Certification of Flight Readiness



- Pending completion of open work, there are no constraints to flight for STS-121
 - Current significant items
 - Left hand TVC tilt hydraulic system air entrainment issue
 - Planned right hand aft skirt hot fire on Pad due to replacement of tilt system hydraulic pump

READINESS ASSESSMENT

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- Pending completion of planned open work and identified COFR exceptions, there are no constraints to launch of STS-114/BI125.

